



ÚOCHB AV ČR

## PhD STUDENTSHIP

[PhD position in high throughput discovery  
of layered functional materials “beyond graphene” (BEGMAT)]

**Job Ref: B-ERC1603**

**Employer:** Faculty of Sciences, Department of Organic Chemistry, Charles University in Prague

**Location:** Institute of Organic Chemistry and Biochemistry CAS, v.v.i.

**Salary:** 240,000 CZK – 400,000 CZK pa (eligible for stipend of 75,600 CZK pa)

**Tenure:** 36 months

**Hours of work:** Full-Time

**Interview Date:** To be confirmed

**Closing Date:** 17 Oct 2016

Informal enquiries to Dr. Michael J. Bojdys, email: [bojdys+jobs@natur.cuni.cz](mailto:bojdys+jobs@natur.cuni.cz)

### **Application Procedure**

Applications should comprise:

\* A completed **applicant information form**

\* A copy of your **full curriculum vitae**

\* A statement indicating the reasons for applying for this post and how your training and experience is relevant.

***If you have any particular requirements should you be invited to interview, please make this clear in your application.***

### **Submitting Applications**

Applications may be submitted by e-mail to [bojdys+jobs@natur.cuni.cz](mailto:bojdys+jobs@natur.cuni.cz) or by post or in person to: Dr. Michael J. Bojdys, Charles University in Prague, Faculty of Science, Department of Organic Chemistry, Hlavova 8, 128 43 Praha 2, CZ.

**MAIL – Please ensure that postal applications carry the correct postage according to the weight and measurement of the item.**

### **Acknowledgement of Applications**

Please note that we are unable to acknowledge postal applications. If you e-mail your application you will receive an automated acknowledgement.

### **Shortlisting and Interviews**

Shortlisting and interview arrangements will be communicated to you within seven days after the closing date.

### **Outcome of Applications**

Vacancies at the University often attract a large number of candidates and it is not always possible to respond individually to every application. If you have not heard from us by **end of Oct 2016** please take it that your application has not been successful.



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## THE POST

Postgraduate research opportunities for ambitious candidates with at least an Upper Second-Class Honours degree (or equivalent) in Chemistry, Physics or Materials Science. Excellent students from a broad range of backgrounds with a strong interest in new materials are encouraged to apply. These three projects in the “Functional Nanomaterials” group involve the design and synthesis of new functional organic nanomaterials under an ERC Starting Grant (30 MM CZK; 1.4 MM EUR) and a GACR Junior Grant (6 MM CZK; 0.25 MM EUR) that combine experimental work with analytical studies and a strong collaboration with international partners. The overall aim of the project is to discover new frameworks and materials to address specific societal problems, such as clean energy and materials security.

## THE PROJECT

There is an apparent lack of porous, ordered materials with full electronic conjugation for the construction of devices in gas storage and catalysis. All known porous materials have at least one major drawback: zeolites and MOFs have limited modularity and no conjugation. COFs often lack conjugation and chemical stability. And microporous polymers suffer from poorly defined morphology. Hence, designing materials that simultaneously combine an ordered, internal structure, porosity, and full electronic conjugation is a great challenge. Recent breakthroughs in this area by our team (*Angew. Chem. Int. Ed.* **2014**, *53*, 7450–7455) demonstrated the feasibility of the synthetic concept of crystalline, conjugated materials with triazine-based graphitic carbon nitride, a compound highlighted as an “emerging competitor for the miracle material” graphene. The project will use high-throughput methodologies and insights into framework design gleaned from our previous work (*Macromolecular Chemistry and Physics* **2015**, DOI: 10.1002/macp.201500287).

The projects involve collaboration between the Charles University in Prague (high-throughput synthesis and evaluation), Institute of Organic Chemistry and Biochemistry (UOChB) (analytics), and TU Berlin (photocatalysis). This is an opportunity for ambitious students to work in a multi-skilled team to develop a new class of 2D “Layered functional materials “beyond graphene” (BEGMAT)” as part of a **European Research Council (ERC)** granted project.



## SKILLS

The successful candidate should have, or expect to have, at least an Upper Second-Class Honours degree (or equivalent) in Chemistry – in particular a strong background and practical experience in (bio-)organic chemistry, polymer chemistry and advanced synthetic methods are required. The studentship of 240,000 CZK – 400,000 CZK pa includes a commitment to help with teaching-related activities in modules currently taught in the Department of Organic Chemistry, as assigned by the Head of Department or her representative. Students are encouraged to enrol in the Czech PhD course to be eligible for an exemption from tuition fees and an additional stipend of 75,600 CZK pa. Czech language classes are provided free of charge by our academic partner EURAXESS CZ.

***It is important to note that this is not an exclusive list.*** If you have relevant experience and a strong track record (e.g., publications and/or patents) in a related area, you are encouraged to apply and state how you would contribute to the project. Expertise in more than one area is desirable. ***We are looking for a team of the best people who can apply their skills to the project, not to fill a restrictive skills list.***

The team skills will be focussed on the following research areas:

- Synthesis of covalent, fully-aromatic materials and fabrication of free-standing 2D layers thereof
- Development of methods for p-/n-doping of these new materials
- Structural (powder diffraction) and dynamical characterisation of the new materials and their response to chemical and electrochemical doping
- Sorption and separation by fabricated membranes from these new materials
- Catalysis by these new materials

## Supervision received:

Direct supervision and reporting to the PI, Dr. Michael J. Bojdys. There are meetings about the project every week at which presentations concerning recent results and future plans are made. You will be required to make formal presentations on your work at regular project meetings. You may be required to work flexibly to make optimal use of equipment time and to attend off-site meetings and experiments involving overnight travel.

## The Institute of Organic Chemistry and Biochemistry AS CR, v.v.i.

The project will be housed in state-of-the-art facilities within the Institute of Organic Chemistry and Biochemistry (IOCB) AS CR, v.v.i., offering the project team a superb research environment (<http://www.uochb.cz/web/structure/31.html>).



## Living in Prague

1) The average salary in the Czech Republic is about 25,000 Kč (900 €) per month, and the average salary in Prague is about 32,500 Kč (1170 €) per month. Below are two links that provide information about the cost of living here (and a third link that compares the cost of living in Prague with that in Berlin).



<http://www.expats.cz/prague/article/prague-relocation/cost-of-living-report-2015-edition/>

[http://www.numbeo.com/cost-of-living/city\\_result.jsp?country=Czech+Republic&city=Prague](http://www.numbeo.com/cost-of-living/city_result.jsp?country=Czech+Republic&city=Prague)

[http://www.numbeo.com/cost-of-living/compare\\_cities.jsp?country1=Germany&country2=Czech+Republic&city1=Berlin&city2=Prague&tracking=getDispatchComparison](http://www.numbeo.com/cost-of-living/compare_cities.jsp?country1=Germany&country2=Czech+Republic&city1=Berlin&city2=Prague&tracking=getDispatchComparison)

2) The take home pay is typically 67 % of the taxable income. The stipend is not taxed. Part of the tax will cover your health insurance.

3) If you end up coming to Prague, it may also be possible to arrange a student accommodation for you. Single rooms cost from 2600 to 5000 Kč (100 - 200 €) per month. For more information visit the official university website. <http://kam.cuni.cz/KAMEN-1.html>